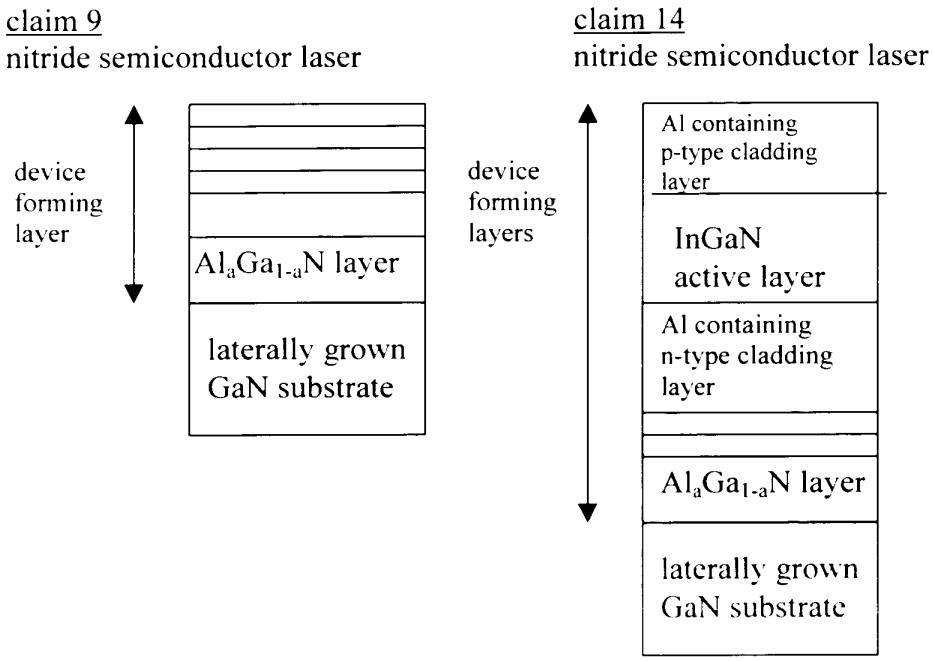
REMARKS

Reconsideration of this application is requested. Claims 7-16 are in the application of which claims 9-16 are directed to elected subject matter.

The previous claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention and to direct them to preferred aspects of the invention. Applicants' claims are now directed to nitride semi-conductor lasers as disclosed throughout the specification, particularly at page 2, line 2 and illustrated in Examples 1 and 6 and elsewhere in the specification. Claim 9 includes the features of previous claims 3 and 6 and new claim 14 contains all the features of original claim 4. These two new claims may be illustrated as follows:

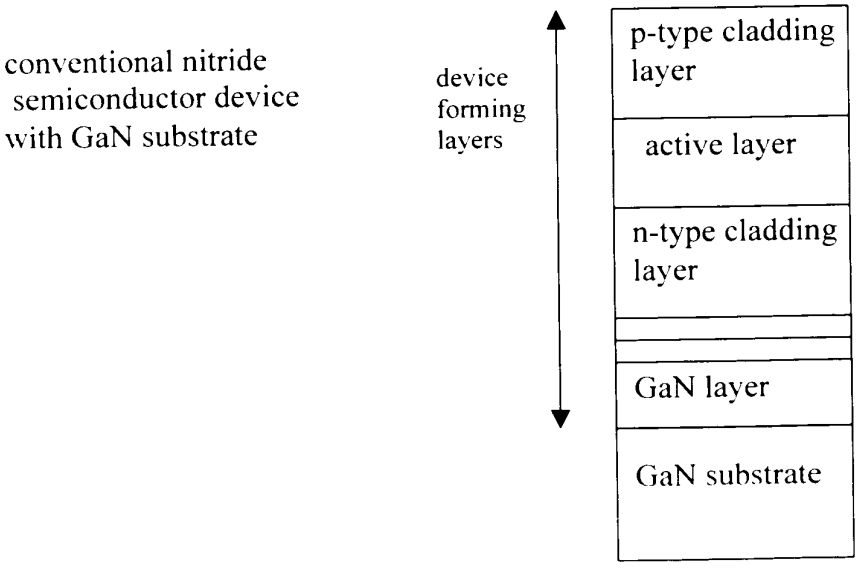


The two issues raised in the outstanding Official Action both deal with the prior art. Claims 1-5 stand rejected as allegedly being

anticipated by Hong U.S. 6,177,292 while claim 6 only stands rejected as being unpatentable/obvious over the same reference in view of Davis et al U.S. 6,051,849. To the extent that the examiner's concerns relating to this prior art might extend to the new claims presented above, these rejections are respectfully traversed.

One of the objects of the present invention is to provide a semiconductor laser device having an extraordinarily long service life; see page 2, lines 2-4.

In a conventional nitride semiconductor laser, since crystallinity of an active layer or cladding layer heavily influences the lifetime of the device, the GaN layer is normally formed on a GaN substrate before forming the active or cladding layers. This is because the GaN layer, which has inherently the same lattice constant and coefficient of thermal expansion as the GaN substrate, had been thought to grow with only a few defects on the GaN substrate.



However, the present inventors have found that, in the case of a GaN substrate grown through a "lateral growth process", extremely small

cracks tend to occur in the GaN layer grown on the GaN substrate (page 2. lines 2 to 18 of the specification). Unlike conventional cracks or dislocations, the small cracks are observed only by a fluorescence microscope. In the present invention, an AlGaN layer instead of the GaN layer is formed on the GaN substrate before forming other layers. This generates compressive strain in the AlGaN layer and prevents the occurrence of "small cracks". Thus, the lifetime of the laser is extended.

The cited Hong reference merely discloses a conventional nitride semiconductor laser and, in fact, teaches away from the present invention. For example, Hong describes forming a GaN layer 51 on GaN substrate 50 before forming n-cladding layer 53, active layer 55 and p-type cladding layer 58 of a laser device (see column 8, lines 37 to 65 and Fig. 6). Hong also describes that GaN layer 42 grown on GaN substrate 41 has significantly less crystal defect concentration (see column 7, lines 7 to 8). In the Official Action the Examiner directs attention to a passage from Hong that describes forming a AlGaN cladding layer 71 on GaN substrate 70. However, the passage cited is not related to a laser but to a light emitting diode (see column 10, lines 17 to 21). Such a construction, as Fig. 7 in Hong, could be employed because the lifetime of the light emitting diode is less sensitive to crystallinity of the cladding layer than a laser.

Davis also teaches away from the present invention. Davis does not teach or suggest the "small cracks" or forming AlGaN layer directly on laterally-grown GaN substrate. Although the Examiner stated that "Davis et al. teaches a major problem in fabricating a GaN semiconductor layer is having defect", the "defect" discussed in Davis is not "small cracks" but dislocations (see, column 2. lines 9 to 16). The dislocation problem had been well known to those skilled in the art, but the "small

cracks" problem was not known, even to those who skilled in the art. Unlike the dislocations that propagate from the underlying GaN substrate, the "small cracks" occur in the first layer grown on the GaN substrate. Also, the "small cracks" can be observed only by a fluorescence microscope.

For the above reasons it is respectfully submitted that the claims of this application as above amended define inventive subject matter. Reconsideration and allowance are solicited.

Respectfully submitted,

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